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ON MEGAPTERA BELLICOSA.

By E. D. COPE, A. M.

(Read October 21, 1870, before the American Philosophical Society.)

For many years American Whalers have been in the habit of taking hump-back whales off the coast of San Domingo, and in other parts of the Caribbean Sea. Desiring to determine the species which is the object of their pursuit, and which, no doubt, haunts the Floridan and

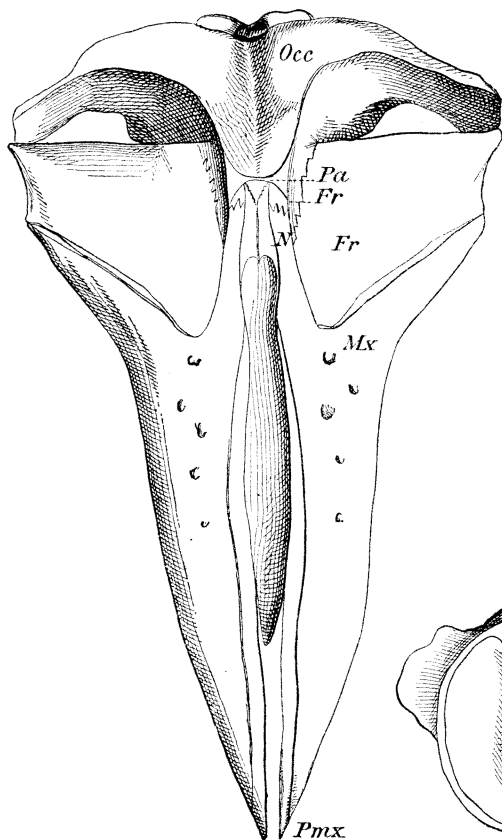


Fig. 21.

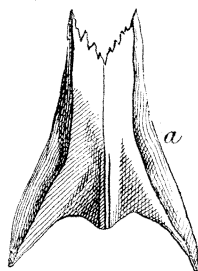


Fig. 22.

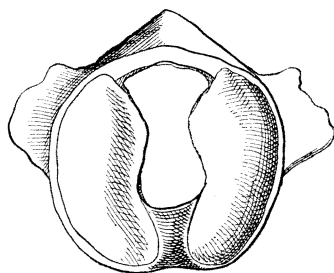


Fig. 26.

other southern coasts of the United States, I wrote to my friend, Dr. A. Goës, colonial physician at St. Bartholomew's, W. I., in reference to the possibility of procuring a skeleton of it. His efforts, undertaken in pursuance of this object, resulted in the preservation of the skeleton of an individual of thirty-two feet in length, which he forwarded to Philadelphia, and which has furnished the following characteristics.

The skeleton lacks a few pieces, viz. : the sternum, pelvic bones, and perhaps four caudal vertebræ. Of the latter, one is a large anterior vertebra, two are median, and one between the latter and the distal. The whole number thus restored will be, Cerv. 7, D. 14, L. 10, Caud. 20 ; total 51. The lengths of the cranium and these elements are :

	Ft.	In.
Cranium.....	9	
Caudal vertebræ.....	8	10
Remainder of vertebræ.....	13	6
	—	—
Total.....	31	4

The *cranium* is not very different in some respects from that of the *M. longimana* of the North. The supraoccipital bone has a deep but open median groove from the foramen magnum to near the horizontal superior surface, where it is wanting. On each side of it there is a considerable protuberance near the middle of the height of that bone.

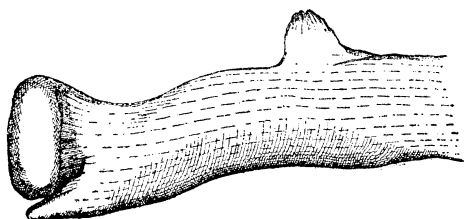


Fig. 23.

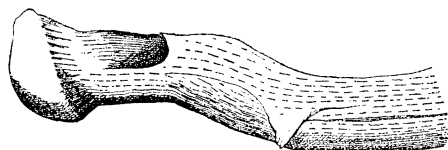


Fig. 24.

The orbital plates of the frontal are plane, with straight anterior and posterior margins. The posterior extremities of the premaxillaries are laminar ; their middle portions are separated by a considerable vacuity. The maxillaries are not slender, and are plane ; they present several large foramina near their middle. The nasal bones present marked characters. Their median face of common contact extends throughout much of their length, and the posterior divergent portion is very short (see fig. 22), and serrate for suture. A beveled portion of the external face (fig. 22a) is concealed by the maxillaries ; the remaining portion is narrow. The median projection of the bones is less than the lateral, and is carried on a keel above the level of the lateral portion of the bone, as

in *Sibbaldius tectirostris*, Cope. The whole form is very different from that of the *M. longimana*. The depth and length of the bone on the interior (median) face, are about equal. The otic bulla is subcylindric, a little flattened on the inner side; its surface is quite smooth.

The ramus of the mandible is slender, and when viewed from above, considerably curved. It has an elevated subtriangular and acuminate coronoid process, quite as in a *Balænoptera*. (Fig. 24 from above.) Proximally the ramus has a slight sigmoid curve viewed from the side (fig. 23), and in the general is more slender than that of *M. longimana*, in profile. The angular process is prominent; the shaft is plane on the inner side, on the external very convex; it is nowhere compressed, and the external pores are widely separated.

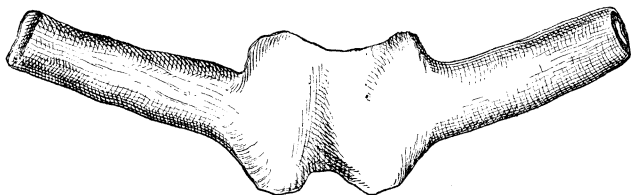


Fig. 25.

The atlas has no neural spine and no *tuberculum atlantis*. The diapophyses are compressed, irregularly truncate, their inferior margin considerably above the fundus of the *foramen dentati*. The axis presents a rudimental odontoid process. Its diapophysis and parapophysis are not very stout, and the former is the longer. The parapophyses diminish rapidly till the fifth vertebra presents only a rudiment on one side. The articular faces of these cervicals are a transverse ovate. The diapophyses are slender and straight. (See figs. 26 atlas, 27 axis, and 28, third cervical.)

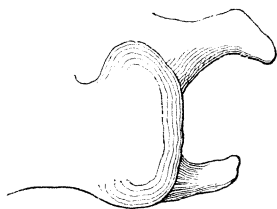


Fig. 27

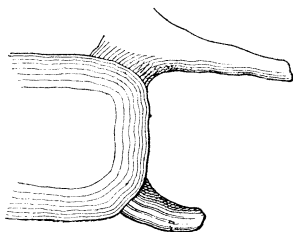


Fig. 28.

Two of the diapophyses of the caudal vertebræ are hooked in form, owing to the failure to isolate anteriorly the foramen which pierces them. The scapula is without rudiment of coracoid and is longer than deep; its proportions are similar to those of *M. osphyia*.

The fore limbs are neither of them quite complete. The epiphysis of the humerus is still free, and indicates that the animal was young when captured. The bones of the forearm are much as figured by Rudolphi

in the *M. longimana*; the radius stout, expanded at the ends, the ulna shorter, more slender, curved and with an olecranon. The metacarpi, or the first series, are quite elongate, except that of the upper (inner) digit, which is stouter. If there were six digits in the second digit (third), the limb measured 8 feet 4 inches, but if, as in *M. longimana*, there were eight, it equalled the cranium in length (9 feet).

Measurements.		ft.	in.
Total length of skull, (axial).....		9	
Length of maxillary to emargination for frontal plate.....		5	5
“ transverse, (to axis of skull) of orbital frontal plate.....		2	5
“ longitudinal.....	“ “ “	2	2
Distal width over orbit.....	“ “ “		11.5
Length nasal bone.....			9
Width “ “.....			1 5
Width cranium behind orbits, (greatest).....		5	4
“ muzzle half way to frontal plates.....		2	3.5
“ maxillary $\frac{2}{3}$ way “ “.....			10.5
Length mandibular ramus on curve.....		9	10
First rib, length on curve.....			37
“ “ distal width.....			7
Humerus length.....		1	9
Radius “.....		2	6
Scapula height.....			25.5
“ width.....			39.5
“ glenoid cavity length.....			11.5
“ “ “ width.....			9

The simple headed first rib indicates the generic relationships to be with Megaptera, as does the entirely simple scapula.

In reply to my enquiries, Dr. Goës gives the following account of the external appearance of this whale. The dorsal outline is strongly convex, and it is questionable whether a dorsal fin exists, as he had not seen it on two specimens from the decks of the vessels to which they were fastened. The color is sooty black above, the breast, belly, and under sides of pectoral fins milk white, marked with scattered black spots or dots.

The condition of the specimen allows of an exact comparison with the species of this genus already known from the Atlantic Ocean. The skeletons of the two Pacific species, are unfortunately unknown, so that comparison with them cannot be made.

From *M. lalandii* of the Cape seas, it may be at once distinguished by its lack of acromion process on the scapula. Cuvier, who figures the Cape species,* does not indicate the deep occipital groove, but rather a keel without lateral protuberances, a difference too marked to be dependent on age; his orbital plates of the frontal are considerably narrower, and his fourth cervical bears no parapophyses. He does not figure such a prominent coronoid process. The coloration of this species is much like that of the West Indian whales.

*Ossements Fossiles, 227-1.

Many marked differences separate it from the Kreporkak, of the northern Atlantic and Arctic Oceans. The elevated coronoid process and peculiar nasal bones distinguish it at once. Thus in *B. longimana* these elements are shorter and wider, considerably separated behind, and with the median process which overhangs the nares, considerably longer than the lateral. The reverse is the case here (fig. 2). The head bears a greater proportion to the length of the body than in *B. longimana*. Thus Flower notes a specimen in mus. Louvain (Belgium), of 32 feet 2 in. in length, of which the head measures only 8 ft. 6 in. In the present of 31.6 in., the cranium is 9 ft. In a specimen at Brussels of 46 ft., the head is 12 ft., nearly one fourth. In a young specimen of 28 ft. 7 in., at Leyden, Flower says the cranium measures only 7 ft. 7 in. In a specimen from the Dee, England, the proportions are similiar. As the length of the flippers is similar to that of the head, the difference is to be seen in this also. Other characters which distinguish the species from *B. longimana*, are the less concavity of the orbital plates of the frontal anteriorly, and the reduction of the lumbosacrals to 10. If Rudolph's figures be correct, the first rib is broader in the present animal, but the figure may be inaccurate. As to color, the pectoral fin is entirely white in the Arctic *Megaptera*; black externally in this one.

The same differences are to be observed in comparing with the *M. osphyia*, in which the head and fin are even shorter than in *M. longimana*, (the proportion being 9.40*) and the coronoid process equally rudimentary. Special features of the latter are seen in the flat, deep diapophyses of atlas, which are much deeper than in the present whale; and the articular area on the hinder angle of the first and other ribs, which is wanting here. The width of the orbital plates distally is, .5 their length in the type of *M. osphyia*, .83 the length in the present specimen.

The species described by Gray (Catal. B. Mus., 1866, 162,) as *Physalus brasiliensis*, founded on some baleen of the "Bahia finner," has been supposed by me (Proc. A. M. Scie. Phila., 1867, p. 32,) to be a *Megaptera*. Certain it is that a *Megaptera* is found at Bahia, as I have seen larger and smaller portions of two skeletons of one, but whether it be the "Bahia Finner" and *P. brasiliensis*, Gray, is quite doubtful. In the first place, fishermen and whalers never call a "hump-back" (*Megaptera*) a "finner;" if they have done so in the case of this species, it evidently has a noticeable dorsal fin, which is wanting in the present whale. In the next place, baleen of the "Bahia finner" has a commercial value, being exported to England, while that of *Megaptera* has none, being coarse and twisted. That of the specimen here described was thrown away by it captors.

I therefore believe that the present whale has not been noticed by naturalists, and is unknown to Zoology. I propose to call it *MEGAPTERA BELLICOSA*.

Dr. Goës says of its habits, that it appears about the island of St. Bartholomew in the beginning of March, or even in February, and remains

*See Proc. Ac. Nat. Sci., 1868-194.

until the end of May. In April and May it is said that they are seen in pairs; standing vertically in the water. When they return, they often come in a family of three, male, female and young, the calf of one or two years old. The bull is wild, and more difficult to take than the female, and he has, on two occasions, smashed the boat of his pursuers to pieces. In June they are said to go farther in the Mexican Gulf, and return eastward in the autumn, but they do not appear among the smaller Antilles at that time.* Dr. Goës supposes that they pass the straits of Florida, or follow the shores of the South Main. He says that the whalers think they pass the middle of winter on the African coast, but this will require confirmation.

Additional note on BALAENOPTERA vel SIBBALDIUS SULFUREUS, Cope.

This species was first brought to the notice of zoologists by Captain C. M. Scammon, in an extended paper on the Cetacea of the Pacific Coast of North America.* From the data furnished by him, the writer was enabled to determine it as distinct from any of the species hitherto known, under the above name, with the following characters :†

Dorsal fin small, conic, situated on the posterior fourth of the back. Form slender; length seventy to ninety feet. Color, above, grey or brown; below, sulphur yellow.

Capt. Scammon having sent to the museum of the Smithsonian Institution four laminæ of whalebone, I am enabled to add important points to the above diagnosis, as follows :

Baleen black everywhere. Bristles intermediate in size, between those of *Sibbaldius tectirostris*, Cope, (finer) and *Megaptera osphyia* (coarser), in six or eight rows, and seven or eight inches in length. Length of plate, without bristles, two ft. eight inches; width of base eighteen inches. Laminæ with weak transverse rugosities.

The above characters show conclusively that this whale is different from the *B. antarctica*, Gray, which is also called sulphur-bottom by the whalers in the South Pacific. The whalebone of the latter is yellowish white.

EXPLANATION OF CUTS.

Fig. 21—Cranium of *Megaptera bellicosa* from above.

Fig. 22—Nasal bones from above.

Fig. 23—Posterior portion of ramus mandibuli, from outside.

Fig. 24—Same as 23 from above.

Fig. 25—Basihyal bone from above.

Fig. 26—Atlas from front.

Figs. 27 and 27—Portions of articular faces and processes of atlas and third cervical vertebræ.

*Proceed. Acad. Nat. Sci., Phila., 1869, p. 51.

† Loc. cit., p. 20.